

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: )  
HOLT ET AL )  
 )  
Serial No. Not yet Assigned )  
 )  
This application is a Rule 53 )  
Continuation of USSN: 09/138,491 )  
 )  
Filing Date: August 24, 1998 )  
 )  
For: HIGH CAPACITY BROADBAND )  
CELLULAR/PCS BASE STATION )  
USING A PHASED ARRAY ANTENNA )  
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PRELIMINARY AMENDMENT

Director, U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

Prior to the calculation of fees and examination of the present application, please enter the amendments and remarks set out below.

In the Specifications:

Please replace the paragraph beginning at page 1, line 1, with the following rewritten paragraph:

This application is a continuation of pending Application Serial No. 09/138,491 filed on 24 August 1998. The present invention relates in general to wireless communication systems, such as but not limited to cellular communication systems, and is particularly directed to a scheme for increasing the capacity of broadband base station without a significant increase in hardware, by combining a set of wideband digital

radios with a phased array antenna to provide higher channel reuse and higher trunking efficiency.

In the Claims:

Please cancel Claims 1.

Please add new Claims 10 to 19.

10. A base station comprising:

a phased array antenna containing antenna elements distributed in a multi-dimensional spatial array;

a wideband digital radio having an operational bandwidth that contains all communication channels of said base station, coupled to said phased array antenna and being adapted to perform receive channel signal processing in which the digital representation of the entire spectrum for each antenna element is divided into receive channels for a respective waveform of interest, and to perform transmit channel signal processing in which digital representations of individual channels are combined into a single transmission channel.

11. A base station according to claim 10, further including an array processor coupled to said digital radio and being operative to controllably define a narrow beam of said phased array antenna.

12. A base station according to claim 10, further including an array processor coupled to said digital radio and being operative to generate amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.

13. A base station according to claim 10, wherein respective sets of antenna elements of said phased array antenna are coupled with respective wideband digital radios, each of which has said operational bandwidth.

14. A base station according to claim 13, further including a processor coupled to said wideband digital radios and being operative to controllably define a narrow beam of said phased array antenna.

15. A base station according to claim 13, further including a processor coupled to said wideband digital radios and being operative to generate amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.

16. A method of increasing the capacity of a base station for a cellular communication system comprising the steps of:

(a) providing a phased array antenna containing antenna elements distributed in a multi-dimensional spatial array;

(b) coupling respective sets of antenna elements of said phased array antenna with a wideband digital radio having an operational bandwidth that contains all communication channels of said base station; and

(c) causing said wideband digital radio to perform receive channel signal processing in which the digital representation of the entire spectrum for each antenna element is divided into receive channels for a respective waveform of interest, and to perform transmit channel signal processing in which digital representations of individual channels are combined into a single transmission channel.

17. A method according to claim 16, wherein step (b) comprises coupling respective sets of said antenna elements with respective wideband radios, each of which has said operational bandwidth.

18. A method according to claim 17, wherein step (b) further comprises controllably defining a narrow beam of said phased array antenna.

19. A method according to claim 17, wherein step (b) further comprises generating amplitude and phase weighting coefficients for defining transmit and receive directivity patterns for said phased array antenna.

REMARKS

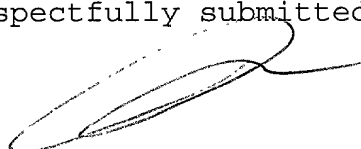
It is believed that all of the claims are patentable over the prior art. Accordingly, after the Examiner completes a thorough examination and finds the claims patentable, a Notice of Allowance is respectfully requested in due course. Should the Examiner determine any minor informalities that need to be addressed, he is encouraged to contact the undersigned attorney at the telephone number below.

Should the examiner find any additional matters in need of correction, he is respectfully requested to contact the undersigned attorney at the telephone number listed below, so that any such issues can be expeditiously resolved.

Claims 10-19 remain in this application.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made."

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Please replace the paragraph beginning at page 1, line 1, with the following rewritten paragraph:

This application is a continuation of pending Application Serial No. 09/138,491 filed on 24 August 1998.  
The present invention relates in general to wireless communication systems, such as but not limited to cellular communication systems, and is particularly directed to a scheme for increasing the capacity of broadband base station without a significant increase in hardware, by combining a set of wideband digital radios with a phased array antenna to provide higher channel reuse and higher trunking efficiency.

In the claims:

Claims 1-9 have been canceled.

Claim 10-19 have been added.